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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—The January Thaw	49
The Aspect of Trees in Winter. (With figure.)	50
The Proposed Forest-reservation in Northern Minnesota	50
Is Grafting a Devitalizing Process?—II. *Professor L. H. Bailey.*	50
Notes on the Mid-winter Vegetation of Central Florida. *A. N. Prentiss.*	52
NEW OR LITTLE-KNOWN PLANTS:—Smilax Pseudo-China. (With figure.) *C. S. S.*	52
FOREIGN CORRESPONDENCE:—London Letter. *W. Watson.*	54
CULTURAL DEPARTMENT:—Ericas. *N. J. Rose.*	55
The Value of Wind-breaks. *E. P. Powell.*	56
Alternanthera Leaf-blight. *Professor Byron D. Halsted.*	56
Galvanized Iron for Propagating-beds. *Wm. C. Strong.*	57
Berberis Thunbergii. *T. D. H.*	57
CORRESPONDENCE:—The Forests of Washington. *Louise Herrick Wall.*	57
The Hardiness of certain Evergreens. *Joseph Meehan.*	57
MEETINGS OF SOCIETIES:—The Western New York Horticultural Society.—I	58
Maintaining the Fertility of the Soil in Orchards. *Professor I. P. Roberts.*	58
NOTES	59
ILLUSTRATIONS:—Smilax Pseudo-China, Fig. 10	53
A Branch of the Black Oak (Quercus tinctoria), Fig. 11	55

The January Thaw.

WITH hardly frost enough preceding to excuse it, the January thaw made its appearance early in the new year to add its terrors of melting snow and heavy atmosphere to the already unhealthy season.

This freak of nature is detestable enough in towns, where there is some slight mitigation of its evils by the intervention of sidewalks, with their attendant shovels and brooms. Though the dripping roofs, the reeking gutters, the slippery pavements, the muddy crossings, make the pedestrian's career precarious enough, the most disagreeable of city thaws does not begin to interfere with domestic comfort, or impede locomotion, as a similar infliction does in the rural districts, where roads and paths become well-nigh impassable with mud and slush.

That part of this annoyance might be avoided by proper care on the part of the road commissioners is well known, but there is always a reluctance shown by towns to make the proper appropriations for the maintenance of the highways, which show all their defects in a thaw.

If all the low portions of these thoroughfares could be properly drained, and a good bed of stones provided beneath, the surface moisture would soon drain off, and leave a firm and reasonably dry surface for travel. The saving of expense in the long run, in the wear and tear of vehicles, and in the time of individuals, now wasted in slow endeavors to get from place to place through sloughs of mud, would well repay a large expenditure to properly prepare the roads in the beginning; but here the penny-wise and pound-foolish policy is apt to prevail, to the trial of horse-flesh and patience.

If any one will remark the difference between a gravelly road and a low undrained stretch of highway, he will promptly recognize the service that a porous understratum renders to the passenger. So soon as the sun thaws the snow the former gives a firm surface for travel, while the latter grows steadily worse as the dissolving snow-heaps pour their waters into the tank formed by the impervious soil. In the one case drying can only be effected by evaporation, while in the other the moisture steals away by a million underground channels, which can be prepared for it by a foundation of broken stone. With the long-suffering of American communities trained to a make-shift policy, we put up with a state of things that was prevalent in England a hundred years ago, but which has been done away with there on the great lines of travel, as it could easily be done away with here by a resolute effort on the part of our townspeople at their annual meeting, when a different policy of managing the roads should be urged and generously sustained.

It is at this season of melting snow and lowering heavens that facilities of travel are most essential to the dweller in the rural districts, compelled as he is to the contemplation of a melancholy landscape, for if the country can ever be a sorry sight it is on one of those bedraggled days when the heavy gray sky comes down upon the sodden earth and envelops it in a dripping mantle. The picturesqueness of a veiled distance, apparent enough through a summer rain, has vanished, and only near objects are visible.

Big tear-drops hang from every joint of the vines on a veranda, as if the skeleton creepers were bemoaning this pitiable sight. Whatever is not mud-color or white in the landscape, is black. The trees have gone into mourning, the fence-rails are plunged in gloom. Near houses look dingy; more distant ones, if visible, shiver forlornly under their chilly trees. The evergreens themselves show a shabby winter raiment of rusty green, specked with brown. Not a snow-bird or a sparrow ventures abroad.

A heavy wagon at long intervals struggles through the mud, or a be-mired foot-passenger picks his dreary way among the puddles and stiff ridges left by the snow-plow in its travels. The very dogs and cats are housed, and cling to the warm fireside rather than venture abroad out-of-doors.

This is winter in undress, without his ermine robe and glittering crown of icicles, and a disreputable old monarch he shows himself when not in gala attire. To those who go forth to face him he gives but a chilling greeting. His sleety breath, his freezing mists, are enough to deter the stoutest-hearted member of the Appalachian Club. There is stimulus in a brisk snow-storm but a winter fog disheartens even the brave, who fear its "grip" even more than its cold embrace. Tremble as we may at nipping cold and icy blasts, we brace ourselves to meet them, and the blood flows more freely for the effort. It is the inert depression of the motionless mist that induces gloom, and against this man needs all his resolution.

Here must the mind act upon the shivering frame, and rouse it to combat with the outside enemy. For it is during these winter imprisonments that the dweller in the country finds time for study and reflection, for the free exercise of thought and the construction of plans for the future. Those influences which tend to throw the mind back upon itself are the real enhancers of intellectual growth. In the roar and hum of contact with human life, in the restless resounding of calls to active duty, the soul fails to catch the note of its own bell, which only in silence and solitude may vibrate with a clear tone.

So sensitive is the intelligence that it more often renders an echo than an original note, which gives us a consolation even for the limitation of facilities for locomotion, and even leads us to be grateful for those natural causes which, against our will, conspire to seclude us for a while to the benefit of our individual growth and to the strengthening of our own mental vibration.

Thus even a January thaw, with its neglected country roads, which prevent travel and interruptions, may serve as a needed refreshment to a jaded intellect by driving it to the true sources of development, meditation and recollection, for it is not so much bodily activity, nor the contact with others, that inspires original thought, as that communing with one's own soul in the stillness, from which the greatest results have ever been born.

The Aspect of Trees in Winter.

THE genuine lover of trees finds it difficult to decide at what season they are the most attractive. Even in the dreariest period of the year they display beauties which are hidden by the luxuriant foliage of summer, and it is only by a study of their naked frame-work that we can discern the reason for their most characteristic appearances at other seasons. One of the most distinctive aspects of a tree in summer is found in the way in which the masses of its foliage break into lights and shadows. A glance at an Oak or Chestnut in the winter will show that the trunks of these trees divide into a comparatively small number of large branches, which leave deep irregular openings for dark shadows in the foliage in strong contrast with the light on well-defined masses. The smoother surface of a vigorous young Sugar Maple in leaf shows smaller and more numerous tracts of light and shade, and this is caused, as can be readily seen in winter, by the more numerous and slender branches of nearly equal length which radiate at a uniform angle from the central stem. Again, the appearance of trees in summer is influenced greatly by the way in which the masses of foliage sway in the wind, and this movement depends on the length and flexibility of the branches. The skeleton of the tree, therefore, not only determines its contour, but it is this structure rather than the mantle of leaves which determines the fundamental expression of the tree, whether of majesty or grace, of cheerfulness or gloom.

We have often invited attention to the marvels of color and texture displayed by the bark of various trees, to the soft tints and varied grace of the spray of different species, and to the delicate tracery of their interlacing branches when seen against the sky. All these can best be seen in winter, and perhaps we are more attracted by beauty of this sort at a season when the fields have no verdure, and the waysides no flowers, to withdraw our attention. The more we study them the more we shall discover to excite admiration, and we may find something characteristic even in the smallest twig or the dead leaf which still clings to it. Gilpin long ago, in his delightful book on forest-scenery, showed that the English Oak develops naturally into its wide-spreading form because of the almost horizontal divergence of the young branches from the stem, and that this same rectangular structure which gives the tree its massive and sturdy appearance can be seen throughout the entire system of branches to the remotest spray. The picture of the extremity of a Black Oak-branch (Quercus tinctoria), on page 55, from one of the series of remarkable photographs with which Dr. Rollins has kindly favored us, might stand by itself as the type or emblem of a northern winter; and the persistency with which the dead leaves have clung, in spite of bitter winds, is a convincing proof of the tough and enduring fibre of the tree. On an Oak of this species which stands alone on some wind-swept upland many of the leaves by midwinter are torn like old banners, and their strong stems are twisted into bundles of yellow cords. When the leaves are finally swept away the ends of these fibres still cling to the spray and present a weird, blossom-like appearance, which reminds one of Witch Hazel flowers. All these will be seen beautifully brought out in the picture, together with the perfect form of the buds and the close texture of the bark.

From an article which appeared in the Minneapolis *Tribune*, of January 19th, it would seem that the leading opposers of the proposed forest-reservation in northern Minnesota have been converted from enemies into friends and have enlisted as promoters of the movement. The Duluth Chamber of Commerce stood in the front of the fight against the reservation, which, in the eyes of the merchants of that town, seemed to threaten its business by crippling the railways and withholding its supplies of lumber and minerals. Mr. Thompson, the Secretary of the Chamber, was, therefore, sent to the annual meeting of the State Forestry Association, at Minneapolis, to make protest against the movement, but when he learned that instead of withholding the timber from use it was proposed to secure a constant lumber-supply, and that the forests, when protected from fire and larceny and skillfully managed, would be much more productive than it is under the present lack of supervision, Mr. Thompson himself joined the association, and was made a member of the executive committee, which is laboring to induce the President to make the proclamation withdrawing the timber-lands from sale and entry. If this reservation is established and placed under judicious control, it will doubtless prove a lasting benefit in many ways to the people of the United States.

Is Grafting a Devitalizing Process?—II.

WE herewith present the conclusion of the paper read by Professor L. H. Bailey before the Peninsula Horticultural Society. In the first part of the paper it was contended (1) that any number of examples of unsuccessful grafting do not prove that the practice itself is harmful, and (2) that it is a fallacy to assume that grafting is unnatural, and therefore pernicious.

3. It is said that own-rooted plants are better than foster-rooted ones. This is merely an assumption, and yet it has been held with dogmatic positiveness by many writers. If mere unnaturalness, that is, rarity or lack of occurrence in nature, is no proof of perniciousness, then this statement admits of argument just as much as any other proposition. And surely at this day we should test such statements by direct evidence rather than by a priori convictions. And here I will repeat that the citation of any number of instances of the ill effects of graft is no proof that own-rooted plants are necessarily better, if there should still remain cases in which no injurious effects follow. Now, if it is true that "own-rooted things are always infinitely better, healthier and longer-lived" than foster-rooted plants, and if "grafted plants of all kinds are open to all sorts of accidents and disaster," then the proposition must admit of most abundant proof. I will analyze the subject by discussing the following questions: *a*. Is the union always imperfect? *b*. Are grafted plants less virile than own-rooted ones? Are they shorter-lived?

a. It is well known that the physical union between cion and stock is often imperfect, and remains a point of weakness throughout the life of the plant. But this is not always true. There are scores of plants which make perfect physical unions with other plants of their own species, or even with other species, and it follows that these alone are the plants which should be grafted. The very strongest proof which can be adduced that the union may be physically perfect can be seen in the micro-photograph of an Apple-graft, published two years ago in the *American Garden* (xi., 65), by Professor C. S. Crandall. The cells are knit together so completely that it is impossible to determine the exact line of union. I have in my possession a number of the micro-photographs, taken by Mr. Crandall, which show the same condition. (These were exhibited at the convention.) Mr. Crandall also figures, on the same page, a microscopic section of an Apple-graft in which the union is very poor, but this graft was made in a different manner from the other, and presents another proof that the operation should be suited to the subject.

These were grafts made upon nursery stock, and it would appear that if the union were good at the expiration of the first year it would remain good throughout the life of the plant. In order to test this point, I procured two Apple-trees, fifteen years old and over six inches in diameter, which had been grafted at the surface of the ground in the nursery. In the presence of two critical observers I split the trunks into many pieces, but no mark whatever could be found of the old union. The grain was perfectly straight and bright through the crown. I am the more willing to cite this case because I had fully expected to find a decayed or dead portion, or contorted grain, at the point of union; but every internal evidence of a graft had disappeared.

So far as the strength of a good union is concerned, all fruit-growers know that trees rarely break where they are grafted. There is an old seedling orchard upon my father's farm into which many grafts had been set. I have myself set many hundreds of these grafts in the tops of the trees, often far out

on large limbs, and in the immediate neighborhood I have set many thousands under similar conditions; and yet, with all the breaking of the trees by ice, storms and loads of fruit, I have never known a well-established union to break away. And I have had the same experience with Cherries and Pears. I have lately tested the strength of the union in a different way. A few days ago I cut two "stubs" from an old and rather weak Apple-tree, which had been cleft-grafted in the spring of 1889. These stubs were sawed up into cross-sections less than an inch thick, and each section, therefore, had a portion of foreign wood grown into either side of it. These sections were now placed on a furnace and kept very hot for two days, in order to determine how they would check in seasoning, for it is evident that the checks occur at the weakest points. But in no case was there a check in the amalgamated tissue, showing that it was really an element of physical strength to the plant. A similar test was made with yearling Mulberry-grafts, and with similar results; and this case is particularly interesting, because there were three species intergrafted—the common Russian Mulberry, Morus rubra and M. Japonica.

From all these considerations it is evident that, admitting that hundreds of poor unions occur, there is no necessary reason why a graft should be a point of physical weakness, and that the statement that "grafted plants of all kinds are open to all sorts of accidents and disaster" is not true.

b. Are grafted plants less virile—that is, less strong, vigorous or hardy—than others? It is evident that a poor union or an uncongenial stock will make the resulting plant weak, and this is a further proof that indiscriminate grafting is to be discouraged. But these facts do not prove the affirmative of my question. There are two ways of approaching the general question—by philosophical considerations and by direct evidence. It is held by many persons that any asexual propagation is in the end devitalizing, since the legitimate method of propagation is by means of seeds. And this notion appears to have found confirmation in the conclusions of Darwin and his followers that the ultimate function of sex is to revitalize and strengthen the offspring by the union of the characters or powers of two parents; for if the expensive sexual propagation invigorates the type asexual propagation would seem to weaken it. It does not follow, however, that because sexual reproduction is good, asexual increase is bad, but rather that the one is, as a rule, better than the other, without saying that the other is injurious. We are not surprised to find, therefore, that some plants have been asexually propagated for centuries with apparently no decrease of vitality, although this fact does not prove that the plant might not have positively increased in virility if sexual propagation had been employed. The presumption is always in favor of sexual reproduction, a point which I suppose will be admitted by every one. And right here is where grafting has an enormous theoretical advantage over cutting or any other asexual multiplication; the root of the graft springs from sexual reproduction, for it is a seedling, and if the union is physically perfect—as I have shown is frequently the case—there is reason to suppose that grafting between consanguineous plants is better than propagating by cuttings or layers. In other words, grafting is really sexual multiplication, and if seeds have any advantage over buds in forming the foundation of a plant, graftage is a more perfect method than any other artificial practice. It is, in fact, the nearest approach to direct sexual reproduction, and when seeds cannot be relied upon wholly, as they cannot for the reproduction of many garden varieties, it is the ideal practice, always provided, of course, that it is properly done between congenial subjects. It is not to be expected that the practice is adapted to all plants, any more than is the making of cuttings of leaves or of stems, but this fact cannot be held to invalidate the system.

It has been said in evidence that grafting is a devitalizing, or at least a disturbing, process, that grafted plants lose the power of independent propagation. Mr. Burbidge writes that "any plant once grafted becomes exceedingly difficult of increase except by grafting." I have never known a case in which this is true. We are now forcing wood from both budded and cutting-grown Roses, and cuttings grow equally well from both. All our fruits grow just as readily from seeds from grafted as from seedling trees, and I have never heard of a well-authenticated case of a plant which grows readily from cuttings becoming any more difficult to root after having been grafted.

But is there direct evidence to show that "grafting is always a makeshift"; that it is a "toy game"; that "grafted plants of all kinds are open to all sorts of accidents and disaster"; that "own-rooted things are in all ways infinitely better, healthier and longer-lived"? These statements allow of no exceptions; they are universal and iron-bound. If the question were to be fully met, we should need to discuss the whole art of grafting in all its details, but if we can find one well-authenticated case in which a grafted plant is as strong, as hardy, as vigorous, as productive and as long-lived as seedlings or as cutting-plants, we shall have established the fact that the operation is not necessarily pernicious, and shall have created the presumption that other cases must exist.

Some forty years ago my father took Apple-seeds from his old home in Vermont and planted them in Michigan. Upon my earliest recollection the resulting orchard was composed of some hundred or more lusty trees, but as most of the fruit was poor or indifferent, it was decided to top-graft the trees. This grafting was done in the most desultory manner, some trees being grafted piecemeal, with some of the original branches allowed to remain permanently, while others were entirely changed over at once; and a few of them had been grafted on the trunk about three or four feet high when they were as large as a broomstick, the whole top having been cut off when the operation was performed. A few trees which chanced to bear tolerable fruit, scattered here and there through the orchard, were not grafted. The orchard offers, therefore, an excellent test in this matter. Many of the trees in this old orchard have died from undeterminable causes, and it was an interesting fact that fully half, and I think even more, of the deaths have been seedling trees which were for many years just as vigorous in every way as the grafted trees; and of the trees that remain the grafted specimens are in every way as vigorous, hardy and productive as the others. And some of these trees have two tops, one of which was grafted shoulder-high in the early days, and the other grafted into the resulting top many years later. And those trees which contained both original branches and grafted ones in the same top show similar results; the foreign branches are in every way as vigorous, virile and productive as the others, and they are proving to be just as long-lived. Here, then, is a positive experiment compassed by the life-time of one man, for my father is still living, which shows that own-rooted trees are not always "infinitely better, healthier and longer-lived" than grafted plants. And, furthermore, cases like this are by no means rare, nor are they confined to fruit-trees. In the case of Peaches I have had a similar experience. The first orchard upon my father's place was composed entirely of seedlings, yet the trees were no longer-lived than budded trees, and they were attacked just as seriously by the yellows. And in this connection I will cite the fact that the old seedling orchards which still remain to us about the country are much more uneven, contain more dead trees or vacant places, than the commercial orchards of even the same age. This is due, as I have pointed out upon another occasion (On the Longevity of Apple-trees, before Kansas Horticultural Society, 1890), to the struggle for existence in the old orchards by which the weak trees have disappeared, while the grafted orchards, being made up of selected varieties of known virility and hardiness, have remained more nearly intact. And if the seedling orchards have suffered more than the grafted ones, it must be because they have had more weak spots.

I contend, also, that the universal favor in which grafting is held in America is a strong presumption in its favor. We differ among ourselves as to the best methods of performing the operation, but I have never heard an intelligent American condemn the system as necessarily bad or wrong. In 1890 there were growing in the United States nurseries 240,570,666 Apple-trees, 88,494,367 Plum-trees, 77,223,402 Pear-trees, and 49,887,894 Peach-trees, with enough other species to make the total of fruit-trees 518,016,612. All of these will go as grafted or budded trees to the consumer, and he will accept none other. It is true that half of them may die before they reach bearing age from various causes, but grafting itself plays a small part in the failure, as may be seen in the case of Grapes and small fruits, which outnumber the tree-fruits in nursery stock, and of which less than one-half probably reach maturity, and yet these are all cutting-grown plants. It is in nineteen cases out of twenty the carelessness of the grower which brings failure.

I have drawn my arguments and illustrations from fruit-trees, because I have had a more extended familiarity with them, and it has been my desire to determine if grafting is of itself necessarily pernicious, rather than to discover its merits in specific cases. I am sure that others can corroborate my conclusions on various ornamental plants, and I could myself cite many instances.

It is impossible, if one considers the facts broadly and candidly, to arrive at any other conclusion than this: Grafting is not suited to all plants, but in those to which it is adapted—and they are many—it is not a devitalizing process.

Notes on the Mid-winter Vegetation of Central Florida.

A BRIEF visit to central Florida, extending over the last fortnight of December and the early days of January, afforded an opportunity for making some general studies of the vegetation there. At first sight, perhaps, the most striking characteristic of the flora as a whole is the sharp line of demarkation between the species occupying different, but adjacent stations, corresponding mainly to difference in soil. The two main divisions of this kind are termed Pine-land or barrens, and hammock. On the Pine-land two species only are predominant—the Long-leaved Pine and the Saw Palmetto. The former are usually of small size, perhaps fifty feet in height, with trunks a foot in diameter, rather sparsely scattered as to numbers, the trunks usually unfurnished with branches except at the upper part, while the undergrowth is almost everywhere the Saw Palmetto, often abundant enough to nearly cover the soil, which seems to consist of nothing but white sand. Whatever may be the appearance of these Pine-lands at other seasons, they are at midwinter sufficiently barren and dreary.

In marked contrast to this is the hammock. Here we find a vegetation suggestive of tropical luxuriance. There are many kinds of trees, some of them attaining a large size, with a dense and tangled undergrowth made up of a wide range of species. Often the vegetation of the hammock rises up like a wall on the border of the Pine-land, with little or no intermingling of the characteristic species of the two floras. In the main the hammock appears to follow or is in the neighborhood of the water-courses, or in the vicinity of lakes, and the soil, though still apparently made up almost entirely of white sand, is far richer in plant-food than that of the barrens; but not infrequently in the midst of the rich hammock appear small patches of Pine-land, called locally Pine-pockets, sharply set off from the surrounding hammock, and possessing all the characteristics of the wide expanses of Pine-barrens, which occupy too much of the surface of the region. However, there are Pine-lands of better quality, where the trees grow to a larger size, and the Palmetto becomes a less distinctive feature of the undergrowth.

Still another division of the general flora is seen in the wet swamps found on the borders of lakes or along the streams. Here the appearance of the vegetation and the representative species are as markedly different from the two previous divisions as these are from each other. The characteristic tree is the Bald Cypress, in form not at all like the typical conifer, the gray trunks quite unfurnished, and the deciduous portions of the broad flat top now turned to a rich soft brown. In inundated swamps there is always an abundant development of those most remarkable root-growths, the knees, sometimes perhaps a hundred pertaining to a single tree, rising in height from one to five feet or more, and usually in the form of sharp narrow cones, and often separated from each other and from the parent tree by intervening spaces of water.

The prevailing color of vegetation everywhere at this season is a dull soft gray; this would hardly be expected in a country where so many evergreens abound like the Magnolias and Live Oaks, to say nothing of the Palms. But vegetation is for the most part now at rest, for here in this sunny clime they have as distinctive a winter, although the thermometer may not indicate it, as in more northern regions. The foliage of the Live Oak and other broad-leaved evergreens is now mature, and has lost the brighter green of the growing season; while the soft gray long moss, draping almost everything in wonderful abundance, of itself gives tone and color to the landscape.

While the northern visitor meets with numerous species of marked interest, perhaps the Palms at the outset take the highest rank. Of the eight unquestioned species found in the state, only four occur in central Florida, and of these only two are common, the Saw Palmetto and Cabbage Palmetto. Small plants of these two species, when seen at a distance, appear to the unpracticed eye much alike; but the always strongly curved midveins of the leaf-blade of the latter are never seen in the former. The Cabbage Palmetto, as seen here in mature and more perfect specimens, is really a stately and beautiful tree, a worthy representative of the noble family to which it belongs. Its favorite place of growth is the banks of streams or lakes if not too wet, sometimes forming groves exclusive of other trees; but it also occurs in the hammock scattered here and there in greater or less abundance.

In making excursions through the hammock one does not overlook the fact that many northern species here find a home. Sabal Palmetto and Liriodendron tulipifera appear as friendly neighbors, the latter often reaching fine proportions, with trunks three feet in diameter. Magnolia grandiflora and Acer rubrum are within hailing distance, the ripened foliage of the latter still clinging to the branches, but the faded color suggesting an ill attempt at reproducing the scarlet hues which helped to make the woodlands of the north brilliant three months ago. On tree-trunks, quite strangers to its northern kindred, the Virginia Creeper finds support. The plants look dwarfed, as though not quite at home, but the still unfallen leaves, unlike those of the Maple, have taken on a brilliant color. Altogether, a considerable number of northern plants are seen, but southern species, as Magnolias and Palms, predominate, and give to the woodlands, as a whole, a distinctive sub-tropical aspect.

At Christmas-time one finds in an hour's ramble along the highways and on the borders of woods perhaps a dozen species in bloom. In this enumeration the straggling and belated flowers of several Asters and Golden-rods, now long past their prime, are not included. With especial interest one comes upon the Common Blue Violet, now fully in bloom, and growing in considerable abundance in damp places; but the plants are less vigorous and the flowers smaller and paler than at the north. On the sandy margins of Lake Charm we find the odd little Utricularia subulata, the single bright yellow flower in size quite out of proportion to the slender leafless stem. On comparatively dry soil are pretty clumps of Pinguicula pumila, the light purple or almost white flowers at first sight appearing more like Primulas than Butterworts. Gelsemium sempervirens, abundant everywhere on the margin of moist woods, is just coming into bloom, while near a group of Palmettos some broad white cymes of the Common Elder are fully expanded. Close down on the sand, in little patches, are the tiny creeping stems of Oldenlandia rotundifolia, the bright white flowers of relative large size. It is very pretty, but has little resemblance to its near relative, the Bluets of the north. These species, and perhaps a few others now in bloom, are here the real harbingers of spring.

But there are still to be seen interesting remnants of the autumnal flora. In this category ought, probably, to be placed the beautiful Coreopsis aurea; but whether of late autumn or early spring, it just now enlivens everywhere the sides of ditches and the borders of swamps with its warm golden color. Now almost out of bloom and coming into fruit is the shrubby composite, Baccharis glomeruliflora; it is six or eight feet in height, with numerous heads of inconspicuous flowers, but the upper branches are more showy with the dense tufts of white pappus, in beautiful contrast with the coriaceous evergreen leaves. This, however, is true only of the female plants, the species being strictly dicœcious, and the pappus of the male plants but little developed.

Altogether, with expectations formed by long familiarity with glowing accounts of Florida as a region of perpetual bloom, one may find the vegetation at midwinter a little disappointing as to the abundance of flowers, but he cannot regard it, on the whole, as otherwise than sufficiently entertaining and instructive.

Ithaca, N. Y. *A. N. Prentiss.*

New or Little-known Plants.

Smilax Pseudo-China.

THE great genus Smilax, represented in the tropics, and in the north temperate regions of the two hemispheres by some two hundred species, extends north in eastern America to beyond the northern limits of the United States. The species are herbaceous, or are stout woody climbers, and the genus is principally valuable, economically, for China-root, a drug once much more esteemed than it is at present, derived from the root of Smilax China, a thorny climber of eastern India, China and Japan, and for sarsaparilla, the root of various species found in different countries of tropical America. Botanists have distinguished fourteen or fifteen species in the United States, but these are still very imperfectly known, and in the flora of the eastern states there is no group of plants of whose life-history there is more to be learned. But as the different species are scattered over a wide extent of country they will never, probably, be thoroughly understood until all the forms are gathered together and cultivated side by side—a difficult undertaking, as many of the species are peculiar to the extreme southern states, and are not hardy in that part of the country where experimental gardens are usually found. The difficulty of

studying the plants of this genus in a satisfactory manner is also increased by the fact that the staminate and pistillate flowers are often produced on different plants, although the entire separation of the sexes does not appear to be as common as has been usually supposed.

The coast region from southern New Jersey to Florida is the home of the greatest number of species in the United States, although several extend into southern New England, and two of them far north. Of the value of the North American species of Smilax as garden-plants as little is known as of their life-history. Some of the species grow rampantly and produce handsome foliage and brilliant black or bright red fruit, and there are many places in the garden where they can be used with good effect. Three species only are well established in the Arboretum; these are the familiar Greenbrier or Bullbrier (Smilax rotundifolia), in all the northern states an inhabitant of moist thickets, which it often makes impenetrable by its climbing well-armed branches clothed with lustrous, broad, heart-shaped leaves—this is one of the most beautiful plants of its class, and one of the best to use to protect a boundary plantation from intrusion; the glaucous Smilax (S. glauca), a less vigorous plant than the Greenbrier, with pale ovate leaves, glaucous on the lower surface and slenderer, and less terribly armed branches, and Smilax Pseudo-China.

This last (see Fig. 10), which is an old inhabitant of the Arboretum, where it has become thoroughly established, is a vigorous plant, rather common in dry or sandy soil in all the region from New Jersey to Missouri and Florida. It produces from tuberous root-stocks stout branches, which climb five or six feet high, and which are sometimes unarmed, and sometimes furnished with occasional weak prickles. The leaves are deciduous, ovate, heart-shaped, sharp-pointed, three or four inches long, two or three inches broad, prominently five-ribbed, dark green on the upper and paler on the lower surface; they are borne on slender petioles from a half to two-thirds of an inch long, or two or three times shorter than the flattened stems of the flower-heads. The flowers, like those of the other members of the genus, are greenish yellow, and individually quite inconspicuous; they are described as dicœcious, but a plant in the Arboretum, where for a long time there was only one individual, has produced crops of fruit every year, and the seeds of this fruit have produced plants. The fruit

Fig. 10.—Smilax Pseudo-China.—See page 52.

is black, a third of an inch in diameter, and rather showy, although it is the beauty of the foliage, and not that of the flowers or fruit, which makes Smilax Pseudo-China a good garden-plant. *C. S. S.*

Foreign Correspondence.

London Letter.

The Introduction of Exotic Plants into European Gardens.—A paper on this subject was read in September, last year, by Dr. Gregor Kraus before the Naturalists' Society of Halle. The author has been to considerable pains in collecting information, and his paper has proved of sufficient interest to be reprinted. He divides the subject into six periods, as follows: The first period was the middle of the sixteenth century, when Hyacinths, Tulips, Lilies and similar bulbs were cultivated in Augsburg. It was not until nearly a hundred years after that they were taken up by the Dutch. The second period was marked by the introduction of North American trees, chiefly into France, the garden of Monsieur Robin, in Paris, then being famous for its collection of these plants. The third period began in the middle of the seventeenth century, when the Dutch introduced many plants from south Africa, and cultivated them in the Botanical Gardens at Leyden and Amsterdam.

A catalogue of the Cape plants in the former garden was published in 1668. Leyden is said to have possessed the first recorded glass house for plants; this was in 1599. During the latter part of the seventeenth century the formal style of gardening known as the French style was discarded by many in favor of the English style, the latter admitting of the use of a greater variety of plants than was possible in a typical French garden. The fourth period opens at the beginning of the eighteenth century and continued till near its close. During this time large numbers of hardy trees and shrubs were introduced from temperate regions. Then follows the Australian or fifth period, when the interesting vegetation of the Australian continent attracted the attention of horticulturists. The bulk of the plants were introduced by Kew and the English nurserymen. Dr. Kraus found the part played by the English in the introduction of exotic plants far too great and important to be included with that of the rest of Europe. He therefore decided to deal with it separately in a second paper. The Australian and Cape plants introduced into England did not receive much attention from the Continental horticulturists until the beginning of the present century. The sixth period is that of the last ninety years, and is remarkable for the enormous number of tropical plants introduced. It was not until Mr. Ward invented his little portable greenhouses, Wardian cases, that much success was attained. The chief cause of success, however, has been the shortening of the journey by the improvements made in ships, the modern "ocean greyhounds" bringing the plants often in less than one-fourth of the time it took half a century ago. Previous to this period the introduction of living plants was left almost entirely to botanical gardens and a few wealthy amateurs. But nurserymen now saw their opportunity, and dispatched collectors in the interests of trade.

Of the modern mania for Orchids, as he terms it, Dr. Kraus says very little. Orchid madness, he states, is almost peculiar to the English, who import plants by the ship-load and dispose of them by large auction sales. The plants thus eventually find their way all over Europe. Special houses even are devoted to single genera (he might have said species!) and some of the varieties are sold for enormous sums.

The taste for all kinds of exotic plants and their cultivation have, he says, not only proved a source of wealth, by adding an important industry, but it has also been of great value scientifically, many departments of botany and even chemistry having made considerable progress by means of the living material being available for study and research.

The history of exotic gardening in England, at any rate, differs in some important particulars from that given above. We therefore look forward with interest to the publication of Dr. Kraus' second paper.

Included in the first paper are various statistics showing the number of exotic plants cultivated in different periods, and, for comparison, of the number cultivated in the three largest representative collections in Europe now, namely, those at Kew, Berlin and St. Petersburg. The figures from Kew, which I know are approximately accurate, are herewith given, since they will, no doubt, prove interesting to your readers:

The number of species and varieties of the various classes of cultivated plants at Kew in 1891 are as follows: Orchids, 1,500; Ferns and Lycopods, 1,500; hardy Ferns and Lycopods, 800; Palms, 500; Cycads, 94; Pandanads, 36; Cyclanths, 19; Aroids, 313; Scitaminæ, 228; Bamboos, 71; succulents, 1,350; miscellaneous stove-plants, 2,756; miscellaneous greenhouse-plants, 3,021; bulbs and Oxalis (indoor), 700; herbaceous plants, Dicots, 2,000; herbaceous Moncots, 1,000; alpines, 1,000; hardy trees and shrubs, 3,000. Total, 19,800.

Roughly, therefore, we may say that Kew has in cultivation 20,000 plants, all, except a very small fraction, exotics. The figures here given do not include such plants as garden varieties of Pelargoniums, Narcissus, Caladium, Roses, etc.

The history of Kew and its collection will shortly be the subject of a special number of the *Kew Bulletin*. Last year was the jubilee of the nationalization of the gardens, although a portion of them existed as a private garden fully 200 years ago. This, with the house adjoining, was acquired by the son of George II. in 1730, and soon became famous for its botanical collection, William Aiton, a pupil of Philip Miller, being placed in charge of it. In 1841 it was handed over to the public by the present Queen, and Sir William Hooker was appointed Director. The collection now comprises almost every species of plant known to be in cultivation.

Horticultural Training.—This subject is now being discussed with some warmth in the London gardening papers. The county councils for the home counties have decided to devote a certain sum annually to the work of teaching the art of gardening by means of lectures. Lecturers have been appointed for each county, and the work of teaching, by means of talk and magic-lantern illustrations, has begun. Some competent judges have questioned the wisdom of this kind of thing, no less an authority than the Director of Kew, Mr. Thiselton-Dyer, having stated publicly that "the cultivation of plants is an art which can only be acquired by practice, and therefore, it appears to me, cannot be taught in the lecture-room any more than painting or shoemaking. I know of no royal or theoretical road to the acquisition of a competent or even useful knowledge of the gardener's art except by beginning at the bottom and going through every operation, from the most elementary to the most difficult and refined. . . . The mere reading of books and attendance on lectures will never, in my judgment, make any one even a moderately competent gardener." This looks like a common-sense way of putting it. At any rate, one would not expect practical gardeners to do other than endorse every word here quoted. On the other side it is held by some that the teaching is not for professional men, but for farm-laborers, allotment-holders and women. Others ask if the English gardener of the present time is as good as his father, and go so far as to say he is no better, though he ought to be. They say he may be a better gardener, but he reveals a lamentable want of schooling when compared with the foreigner. I hear, too, that gentlemen complain of the want of polish in their gardeners, which makes them less pleasant companions in the garden than is desirable. Altogether, these critics seem to think that professional horticulture in England is in a very bad way. I had thought hitherto that England was the best horticultural school in the world, and that men trained here were in con-

stant demand wherever good gardening was wanted, whether in America, Australia, New Zealand, India, and even some Continental countries. I had entertained a suspicion that the several million pounds' worth of fruit annually imported into England was very largely sent here by enterprising Britishers who had settled in other countries where good fruit could be grown at less cost than in England. It appears from what is now written and preached that all this is ridiculously wrong, and that we need to supersede the old-time gardeners with a new and superior stock developed by means of lectures and magic-lanterns.

London. *W. Watson.*

[Of course, the way to learn an art is to practice it rather than to read about it. But if in addition to this practice the pupil is judiciously instructed in some of the principles of the sciences related to the art, he ought to be a more intelligent practitioner and a broader man.—ED.]

Fig. 11.—A Branch of the Black Oak (Quercus tinctoria).—See page 50.

Cultural Department.

Ericas.

THE ornamental Ericas of the Cape of Good Hope number between four hundred and five hundred species. They are neat plants, with closely set foliage and an abundance generally of small cup or urn-shaped flowers, but sometimes with larger, tubular ventricose corollas with well-developed segments. Some are very fragrant, as the favorite white-flowering E. caffra.

In addition to the numerous species and natural varieties, a number of hybrids have been raised in European gardens, such as the attractive and extensively cultivated E. hyemalis. These hybrids are generally easier grown, more robust in habit than the species, and equally floriferous.

In Europe, and especially in England, enormous quantities are grown every year for the market for house and parlor decoration. The general size of the plants brought to the London market varies from eight to eighteen inches in height. All are perfect in shape, healthy, and covered with flowers. The kinds generally grown for this purpose and kept on the market from autumn until spring are E. caffra, E. hyemalis, E. gracilis, E. colorans, E. hybrida, E. ventricosa, E. Cavendishiana and E. persoluta alba, but many other varieties are grown for commercial purposes.

While the moist, equable climate of England is favorable for the growth of Ericas, there is no reason why they should not be grown to equal perfection in this country. The bright summers will tend to ripen the shoots well and produce flowers in profusion. They do not like artificial heat, but will do well in a winter temperature of from thirty-five to fifty degrees. This can be had during a considerable part of the winter without resorting to fire-heat. If kept in a cool and somewhat shady position during the hottest part of the summer, they are not likely to be injured by the extremities of the climate. Systematic cultivation is, however, essential; and it would hardly pay to go through all the details with a small number of plants in order to grow them for the market to perfection. Cultivation for commercial purposes is likely to be profitable only when carried on on a large scale.

Without giving a list of the most desirable kinds, it may be said that, in addition to those already named, there are many

others which are interesting from every point of view. They may be had in almost any color from pure white to yellow, or through various shades of pink and red to purple. They differ widely in habit of growth, in shape and disposition of flowers and leaves. Some of them bloom in October, and a succession of flowers can be had until May.

The propagation of Ericas from seed requires much care and patience. The seeds are very minute, and the young plants tender and liable to damp off in a dull season. Still, as new and valuable varieties may be raised by this means, it is sometimes resorted to. The seed should be sown as soon as ripe in well-drained pots of finely sifted peat and silver sand. Pack the soil well in the pots by shaking them, and if the soil is very dry it should be thoroughly soaked before sowing. Sow the seeds evenly, and a gentle sprinkling will cover them sufficiently. The seed-pans must be kept in an even temperature of about sixty degrees in a light greenhouse. The air should be pure and dry, while the pots should be kept moist, without too much sprinkling, which will cause the seeds to decay, especially if they are old. Each pot should be covered by a pane of glass, and this must always be kept free from moisture, especially at the time of germination. Moist or overheated air at this period is almost certain to cause serious loss. When the plants are large enough to be handled they should be pricked off in other pots or deep pans of well-packed soil. After this they must be kept close until a strong healthy growth has begun. Water containing alkaline or mineral substances in solution should be strictly avoided. Rain-water is at all times the best for Ericas.

When the flowering season is over and growth commences a number of young shoots will be formed at the base of almost all larger plants. These shoots invariably give the best cuttings. As soon as they are half-ripe these shoots, with their lower leaves removed, should be cut, inserted obliquely in shallow pans filled with the same kind of soil as for seeds, except it may contain more sand. It is of importance not to insert the cuttings too deeply; in fact, the base should be covered only sufficiently to keep them firmly in place. All pans should be covered with bell-glasses, which must be kept dry by wiping away, as often as possible, all water condensed on the inside of the glass. If a propagating-house entirely devoted to Ericas, Azaleas and the like is used, no bell-glasses are required. The stage of such a house should come close to the glass, and a couple of hot-water pipes will be wanted to supply a gentle bottom-heat. When in use for this purpose all ventilating ought to be given below the stage when this is necessary. Facilities for shading on very bright days should be provided. The pans containing the cuttings should be plunged to the rim in coarse sand. Only one variety should be inserted in each pan, so that the growth of all may begin at once. When the cuttings are well-rooted abundant ventilation is needed.

In the following spring the young plants are to be potted singly in two-inch pots, and if kept in close frames for some time they will soon root well. As the plants go on growing attention must be paid to repotting before they become pot-bound, and the young shoots should be trimmed to make the growth dense and uniform.

Young plants should be repotted every spring and removed to the open air early in summer. Beds should be prepared in the open grounds for this purpose by covering them a couple of inches deep with cinders or ashes and leveling the surface. The beds are made four feet wide, and the plants placed at a sufficient distance to allow light and air on all sides. Young plants must be trimmed several times during the season. They can be cut in such form as the natural tendency of each species suggests. This cropping should not extend below the soft wood. Plants for flowering must not be trimmed in this manner, as they must have sufficient time to ripen their shoots.

Ericas must never be allowed to dry up, but overwatering is very injurious. When potting, the roots must not be injured or disturbed except at the bottom, when the young roots should be gently disentangled and the soil should be packed in very firmly. Common peat, with very little sand, is best for the more robust, soft-wooded kinds, which can also be potted less firmly than the smaller hard-wooded species, which in their native land grow in crevices of rocks, on hard stony ground, chiefly in soil produced by their own decaying leaves. For old and large specimens it is advisable to put some bone or horn-shavings in the bottom of the pot or tub, or use well-decayed cow-manure.

During dull moist seasons Ericas are apt to suffer from mildew. The only way to counteract this evil is to sprinkle them with sulphur. If planted too deep the water is liable to cause the bark of the lower part of the stem to loosen and decay. It is better to plant a little too shallow than too deep.

New York. *N. J. Rose.*

The Value of Wind-breaks.

WHEREVER winds have a destructive sweep there is a lack of those provisions that nature would supply if let alone. Run an old-fashioned fence across a lot, and in ten years it would be the centre of a row of young trees, forming a solid wind-break. On knolls hereabout, if barred from cattle, Hemlocks and Pines start. Fifty years ago I dragged rails to enclose a bit of land, which, to my boyish eye, was a delightful spot, where some tiny evergreens were trying to get a start on ridges and slopes and knolls. I was not interfered with, and so the cows were shut out. The result is now a thing of beauty. But that is not all; the winds that used to leap off the hill-top down on our orchards and barns are now decidedly broken. The only conifer native to our hills is the Hemlock, and its beauty is hardly equaled. But the Arbor-vitæ readily takes to our soil, and I have used that for my hedges. Under the lee of these the sharp winds never are felt, and the effect is largely to restore climatic conditions that existed before the forests were so extensively cut away. Quinces, for example, bear once more as they did fifty years ago.

On one side of a street here fruit abounds that cannot be grown across the way. I have no trouble with Diana, Isabella and Iowa Grapes, while even Concords do not get a fully ripe flavor a few hundred rods away. This is, to be sure, owing partly to the contour of the land, but it is also due largely to the additional protection given. The advantages are not only general, but special and local; we cannot only affect climate on a large scale by forests and by our plantations of screens and wind-breaks, but we can make our own lawn or orchard climate.

Where land is abundant a belt of evergreens may be set. I have in mind one large orchard in this town, about one-third of which is sheltered in this way, and is in perfect health; two-thirds are exposed to the sweep of north-west winds, and the trees are of no use except for fuel. The line of demarkation is plain to every one who drives by, and the contrast is almost startling. The effect on annual crops may not be so apparent, but it is logically sure. I am confident that one of the first duties of a purchaser of land is to study its exposure and plant screens against the most trying winds. While we are waiting for the Government to solve the forestry problem, we can in a small way control our own local climates to advantage.

Clinton, N. Y. *E. P. Powell.*

Alternanthera Leaf-blight.

DISEASED specimens of Alternantheras have been recently received from four widely separated greenhouses in the eastern states, and a visit to several propagating-beds in New Brunswick shows that the trouble in question is prevalent here. In its worst form the leaves blight, coil up and fall away, leaving the short stems of the plants bare. When the disease is in a mild form only, here and there a leaf is seen with a brown spot upon one side or at the tip. These spots contain countless threads of a parasitic fungus, pushing into the healthy portions of the leaf and spreading the spot. Upon the older portions of the brown patch a considerable number of nearly spherical buds may be seen half-sunken within the substance of the leaf. At the upper free side in the centre is a small opening, through which, when mature, the small colorless spores exude in large numbers, and by means of which the blight fungus is able to spread through the propagating-bed. This disease is caused by a species of Phyllosticta, which, while probably not the same, is closely related to Phyllosticta Amaranthi, upon a species of Pigweed (Amaranthus retroflexus), a near neighbor of the Alternantheras, and a member of the same family. One reason why this blight is not particularly conspicuous is due to the variegated foliage of the host. Upon plants with uniformly green foliage a blight equally abundant would be quickly observed. It is, however, none the less destructive because not easily seen, and should it continue to prevail it is quite certain that some preventive measures will be needed. As this blight is similar in nature to the black rot of the Grape, it is doubtless true that the Bordeaux mixture would prove effective. Better than this, because not coating the plants with lime, would be the carbonate of copper compound, made as follows: Dissolve three ounces of carbonate of copper in one quart of ammonia, dilute with water to twenty-two gallons, and spray the affected plants at least once a week.

There are so many fungous enemies in the greenhouse that the spraying-pump will come to be a regular adjunct to the propagating-bed and to the growing of plants under glass.

Rutgers College. *Byron D. Halsted.*

Galvanized Iron for Propagating-beds.

IN building a greenhouse five years ago I made a propagating-bench of the usual width and fifty feet in length. As a test, half of the bed was laid with a slate bottom and the other half with galvanized sheet-iron. The experience of these years does not show any essential difference in the rooting of cuttings in the bed. The bottom-heat does not seem to vary with the slate or the iron, when the average depth of three to four inches of sand is used as a covering. It is probable that less depth of sand and careful tests would show a higher temperature on the iron than on the slate; but in our ordinary use of the greenhouse there has been no appreciable difference.

It has been a surprise to me that the galvanized iron shows no sign of wear. The bed now looks as though it would last as long as the two by three-inch scantling upon which the sheets and the slate were laid. Having had the same satisfactory results in the use of sheet-iron in other places, I decided this season to use the sheets as a bottom for propagating-beds which we were building. As the houses were constructed mainly for one purpose, the result has been more than satisfactory. The beds can be maintained at any desired degree of temperature and moisture with the greatest ease. In some houses and under some management there might be danger of an excess of moisture in the sand for some cuttings; but in such cases it would be easy to provide drainage by punching holes in the sheets, as might be found necessary. Ordinarily, this would not occur.

In regard to cost, I find that the sheet-iron comes next to boards. For a heavy quality the cost is $4.50 per 100 square feet. Considering the ease in laying, this must be regarded as a moderate expense; and considering the very satisfactory results, it seems to me that it is worthy of more general use.

Waban, Mass. *Wm. C. Strong.*

Berberis Thunbergii.—Those who desire to increase their stock of this handsome shrub will find this a favorable time to sow seeds. Seeds from berries gathered from the bushes now will germinate better than those gathered earlier in the season, as the weathering effects of frost seem to help germination. The seeds should be rubbed clear of the pulpy matter which encloses them, as berries planted whole will sometimes lie in a dormant state for two years, or, at least, until the resinous matter surrounding them has decayed. Even with this precaution, it takes nearly a whole season for the crop to come up. Like almost all Barberries, this species is very easily reared, and seedlings may be planted directly from the seed-bed as soon as they are large enough to handle. This, probably, is the best of all the Barberries which are hardy in this latitude. B. Darwinii and B. stenophylla, two equally handsome species which are evergreen, at least in southern Europe, are doubtfully hardy here. With full exposure, B. Thunbergii makes a neat and perfectly regular bush. There is at the Bussy Institute a remarkable specimen, being one of the first raised in this country, which every autumn is covered with thousands of scarlet berries, and is so conspicuous an object that it attracts attention from a considerable distance. The berries hang on the bushes until spring, as no birds or animals seem to care for them.

Wellesley, Mass. *T. D. H.*

Correspondence.

The Forests of Washington.

To the Editor of GARDEN AND FOREST:

Sir,—The forests of western Washington are inconceivable to those to whom the word forest suggests a vision of sun-lit green. Green they are, but it is the sombre darkness of the conifer. To the woods of the Blue Ridge they are as the movement of Milton's lines to the lilt of Dobson's song.

Imagine yourself seated in an old stage, with a pair of Cayuse ponies hitched to it, and driving for the first time, on a December afternoon, through a belt of Washington timberland. The timber skirting the stage-road will, of course, be very inferior, since the road has chosen the direction of least resistance; but in your innocence you will not guess this, and will promptly conclude there never was another spot just like this peculiar one where you find yourself. It is mid-December, but the air is like one of the misty days of late October; and the grass on the road-side has a vividness of green, a certain mossy depth of color, as though the earth were covered with layer upon layer of tiny-leaved grass that is like nothing but the spring grass of Great Britain. There are no flowers by the side of the road, but Ferns in the wildest luxuriance. They range in size from the minutest seaweed-like tracery of green to the Elk Fern, as tall as a man, and with the decorative vigor of a tropical Palm. Above all this, so far above as to seem of another world, reach the forest-trees. They are all evergreens. Round-bodied, straight and flawless, they stretch upward one, two, and even three hundred feet. They are so tall that one scarcely observes the slightest tapering in the majestic columns at the point where at last they throw out the first limb, laden with heavy foliage of down-drooping darkness. There are not twenty or a hundred of these trees in range as you creep along, but tens of hundreds; they grow as closely as Hop-vines in a Hop-yard. The wonder that ever increases is how the soil supports such a growth.

In many places the trees have fallen, and lie tangled together, forming a barrier twenty or thirty feet high. If they should all fall the pile they would make would be about as high as the trees now stand. The density of the forest makes it almost impenetrable; for, beneath the up-reaching Pines, the ground is covered with the tough tangle of Sallal (Gaultheria Shallon), hung with pink waxy bells, which enmesh the feet at every step; and the riot of the Ferns, that snap back into the face, further impede the way. Four miles is as far as a strong man can walk in a long day's struggle with the baffling, entrapping blockade of living green.

The gigantic conifers and the immense Ferns are the living representation of those pictures of the carboniferous age that decorate the pages of geologies. We seem to have prowled into Nature's laboratory, and caught her at coal-making some eons too soon. Many beds of coal have been discovered; but it is lignite coal, still soft and half-formed. The stone, too, is crumbly and unfinished. The whole energy of the black mellow soil goes into the monster evergreens, and there seems no place for flowery frivolities beneath their sombre magnificence. This is in the interior of the woods. Down near the salt-water of the Pacific the character of the growth changes. There the Tide-land Spruce (Picea Sitchensis) prevails, a scrub growth, averaging about one hundred feet in total height, and of a gnarled and irregular figure. Upon every notch or crotch of the limbs is a clump of moss, so vividly green that even the grass pales in comparison; and, from this bed of mold, spring hundreds of Ferns, but always of one sort, with a delicate but simply pinnate frond.

The curious excrescences of moss give the Tide-land Spruce an unnatural look that is slightly revolting; it takes the character from the trees' anatomy; but, in themselves, these bosses of green, pierced by the Fern-fronds, are lovely. The south sides of many of the trees are covered with this deep moss, and from it the Ferns cascade downward to the ground.

Among the Tide-land Spruce are patches of small Alders, gray for the season, and grayer with fine filmy Spanish moss, hanging in shreds, and giving a ghostly indefiniteness to their outlines. Under-foot the same vivid moss and Ferns, only the Alders, stretching their twigs like a seine in which filaments of seaweed have been caught, speak to us of winter in this climate of moist mildness, in this "land where all things always seem the same."

Bergen Point, N. J. *Louise Herrick Wall.*

The Hardiness of certain Evergreens.

To the Editor of GARDEN AND FOREST:

Sir,—Your correspondent, Mrs. Dandridge, suggests reports on the hardiness of certain evergreens. In this neighborhood English Laurels do not survive, even when given slight protection. I have never seen one left outside for the winter that was alive in spring. Aucuba Japonica does well where it gets a little shelter; near a dwelling or under the shelter of deciduous shrubs it will survive without any covering. Hydrangea hortensis and H. Otaksa are never killed outright by the winters here, but trying seasons sometimes kill the ends of the branches, and then we get no flowers, for the flowers are produced on the wood of the previous season. So, to be sure of bloom, it is better to pack leaves among the tops. I had no idea that Chimonanthus fragrans was considered tender. We never protect it hereabouts, and it is never injured. Deodar Cedars do very well when protected for a few years while small. There are very fine specimens here, one in particular, which stands on a rocky eminence. There are several flourishing trees of the great evergreen Magnolia about us, and many more could be had if they were intelligently looked after for a few years after being planted. A

great step toward success is to get plants from seeds perfected near home. Seeds from Washington or Richmond trees would give a hardier race of seedlings than would those from farther south. I would advise Mrs. Dandridge to cover the top of her plant with forest-leaves instead of having it protrude from the barrel. In late winter it is the extreme tops that suffer. Over a small Magnolia I have placed this winter a box with a removable cover. When it is not freezing weather the top is taken off. There are no leaves packed about the plant, and I feel confident that the shelter the box affords will suffice for its protection. Yucca angustifolia is quite hardy, but Y. gloriosa is not. The latter lives, but loses its tops nearly every winter, so that it makes no trunk. The pretty shrub, Leycesteria formosa, so well known in English gardens, survives our winters. And we are trying again this winter, although we lost our plants on a previous trial, Choisia ternata, Ilex cornuta, Nandina domestica and Elæagnus pungens variegata.

Germantown, Pa. *Joseph Meehan.*

Meetings of Societies.

The Western New York Horticultural Society.—I.

THE thirty-seventh annual meeting of this prosperous society last week at Rochester brought together 250 of its 300 members. The address of the President, Mr. W. C. Barry, was a comprehensive review of the horticulture of the past year. The abundant crops of fruit and the comparatively small returns was the strongest proof, he thought, that the grower should exercise the greatest care in packing and shipping his products. The loss from lack of careful sorting was never so apparent as in years of plenty. The importance of recent discoveries in the methods of combating injurious insects and the diseases of fruit-bearing plants was spoken of, and credit was given to the aid which experts in economic botany and entomology were giving to practical fruit-growers. The possibilities of the improvement in fruits and in ornamental plants were dwelt upon, and the society was urged to encourage every effort to produce fruits surpassing the varieties now in use, in size, in color, in appearance, and of increasing the beauty and attractiveness of flowers and ornamental plants. The society was congratulated on the work it had accomplished, on the harmony which had prevailed through its history, on the regularity and growing interest of its meetings and the steady increase of its membership.

As in former years, discussions relating to orchard-fruits, especially to apples, pears and plums, were the prominent features of the meeting. Not only did the greater number of the set papers relate to these subjects, but the discussions which followed them, and which were participated in by a large number of the audience, showed that the members were deeply interested and thoroughly schooled in the practice of the new methods. Papers referring to plant-diseases and their treatment were followed by searching questions, to which the experts present replied, and many practical growers related their experience in the application of insecticides and fungicides. As a rule, these applications were reported as beneficial, and this was particularly true of the applications made to nursery stock. There seemed to be a general opinion that ammoniacal carbonate of copper was preferable for later applications in the case of fungous diseases of the Grape after the Bordeaux mixture had been used early in the season. The objection to the use of the Bordeaux mixture late in the season was that the traces of the fungicide remained upon the fruit, and although analysis showed that the amount of copper upon the grapes was less than the amount present in many of the foods which are continuously eaten by man, nevertheless the appearance of metallic coating on the grape was forbidding, and it should be avoided if possible.

There are no more valuable reports published than those of the meetings of this society, and, therefore, it is a matter of general interest to know that a larger supply will be printed and distributed hereafter. The expense of the printing of these reports will hereafter be borne by the state, and they will be bound up with the reports of the State Agricultural Society, and in this way have a wider circulation.

Mr. Wm. C. Barry was again elected President; Mr. S. D. Willard, First Vice-President, and John Hall, of Rochester, Secretary and Treasurer.

One of the most interesting of the papers read was by Professor I. P. Roberts, of Cornell University, and we reproduce it below almost entire. Our report of the meeting will be continued next week.

MAINTAINING THE FERTILITY OF THE SOIL IN ORCHARDS.

If the land produces well, we usually call it fertile; if it produces nothing, we say it is barren; and yet the land which produces little or nothing often contains far more of the elements of plant-growth than does the productive soil. The products of cultivated land are not, as a rule, the measure of the amount of plant-food which it contains, nor the amount which may be liberated by scientific culture. In our farm vernacular fertility means production, whereas it should mean the amount of plant-food which can be profitably set free by the best methods. To the orchardist the amount of plant-food which the trees can get out of the land is practically the true measure of the fertility of that land.

Now, the roots of an orchard, after it is fairly well grown, occupy very fully the entire ground except a small portion of the surface. From this time on, the feeding roots are practically confined to the exact ground from which they have been feeding for the last fifteen or twenty years. The roots of fruit-trees set the ordinary distance apart have extended themselves nearly as far into the subsoil at fifteen years of age as they will ever go, because there is little more food that can be reached in that direction. The surface roots have by this time extended themselves as far as they will grow, because they have met and interlocked with those of the adjoining rows.

How to get the orchard grown up to the time when it is in full bearing is now to be considered. First, the land should be reasonably dry. If it is very wet, it should be made dry by draining; if only slightly wet, the field may be thrown into ridges as wide as the rows of trees are to be apart, and if the plan is not to drain the land after the trees have begun to bring an income, then the rows and ridges should be wider—that is, a little land may be sacrificed in order to save the expense of draining, and where the land is not too dear, this is often the cheapest way to solve an embarrassing problem. Having decided the method of drainage, a full year should be given to preparing the land. It should be plowed deep and often, and if thrown in ridges or lands the subsoil-plow should be used freely in the bottom of the dead furrows. If the land is at all sandy and poor the plowings should be not less than four, and none of them should be later than the middle of September. With this start, for the next five to fifteen years, according to the variety of trees set, enough plant-food can easily be set free by shallow plowing, cultivating and the use of surface crops. Many a young orchard is ruined by overfeeding with manures, as are also many by starvation, while the soil contains an abundance of food for all necessary growth. The tree is too often treated like the unwise dairyman treats his stock, which are fed to repletion when young, and semi-starved at maturity, when the demand for food is great, especially if a large surplus product is to be secured. Healthy, continuous, hardy growth, and not too much stimulating nitrogen, is what is wanted in both cases.

In rare instances the land may be deficient in fertility. In that case, a little mineral fertilizer will be all that is needed. When the orchard begins to fruit heavily there will be an extra demand on the soil for food, and that must be met quickly and in a liberal way if large, superior fruit is secured. As the roots have been drawing upon this soil for several years, and as they can find no soil from which they have not already extracted the larger part of the readily soluble food, the tree suffers; the quality and quantity of the fruit diminish, and the tree becomes an easy prey to its enemies if something is not done. Something usually is done at about this period of the orchard's existence. Not infrequently it is seeded down to Timothy, and very often this grass is cut for hay, and thus more fertility is taken from the land. Of course, the Apple-orchard cannot well be kept under the plow all the time after it has come into full bearing, because of the inconvenience of gathering the fruit on a plowed surface in the wet fall months. There is usually a better way than this. Clover should be raised so far as possible in the orchard, and it is not necessary to plow it up often, as Clover catches on sparsely-seeded land, nearly as well without as with plowing. This treatment usually

provides sufficient nitrogen in conjunction with a little farm-manure.

It should be kept in mind that we are dealing with trees that have occupied the ground for several years; that have creamed the soil; that have already trespassed upon and robbed their surrounding neighbors, and that in turn have been robbed; and there is no escape from slow starvation if the trees are reasonably thick and nothing is done.

And first it should be remembered that, for the good of the trees and of the land, and for the total value of the product, the amount of fruit raised on a tree should not be large, and the quality should be of the best. Bearing this in mind, some questions arise. Is it not possible to prune the orchard by the same rules which are observed in trimming Grape-vines? Our grandfathers let their vines grow as they would, and they never produced any really fine bunches of grapes. As soon as we learned to control and direct the growth of the vine the value of the fruit increased a hundred-fold, while the least possible amount of fertility was removed from the land. Is it not quite possible that fertility might be conserved, and the quality of King apples, say, be improved by reducing the length of the limbs upon which they grow? Is it true that the nearer the total product of fruit is to the food-supply of the tree the better the results? or, to state it in another form, Are the apples improved when the material of which they are formed is transported eighty feet through root and branch before they receive it? Is the soil of the orchard unnecessarily drawn upon by growing too much timber?

We assume that the fertility of the orchard has been maintained up to the time of its bearing. What I have said also implies that the trees have not been unduly forced by manure, but have made a steady, healthy growth, and have come into bearing early. Just as a heifer is simply kept growing and great care is taken not to overfeed or change the direction of her inbred tendencies while she is young, and as she is more liberally fed as soon as she begins to produce something, and as she is fed moderately, liberally or very liberally, according as she responds to the food given, exactly so should the orchard be treated. The amount and kind of food furnished to it should be studied as carefully as is the ration of the dairy-cow. What kind of food does the orchard want? Like other plants, it is likely to have enough of all kinds except potash, phosphoric acid and nitrogen. How shall it be secured? Would it be best to get the annual dressing of fertility wanted by purchasing commercial fertilizers, or by the purchase of cattle-food, to secure the desired elements in the form of farm-manures by the help of animals?

If the orchard contains ten acres, it will carry one hundred sheep from May to October, provided one-fourth of their food be furnished to them in the form of bran and cotton-seed or oil-meal. One hundred sheep, weighing eighty pounds each, will require for one-fourth of their daily sustenance one-half pound of meal per head. In the spring they will want something less than this, in the fall something more. If these animals take ten per cent. of the manurial value from their food for their natural growth, there will still be left scattered on the land in solid and liquid droppings 228 pounds of nitrogen, 146 pounds of potash and 90 pounds of phosphoric acid; or 22.8, 14.6 and 9 pounds respectively per acre.

One hundred and fifty bushels of apples—that is enough to the acre if they are good enough, and too many if they are poor—contain about eight pounds of nitrogen and twenty-four pounds of ash, thirteen pounds of which is potash, and one pound of phosphoric acid, worth together $1.86.

How much the trees will require for increased growth, how many of the leaves will be blown away, how much nitrogen will escape by leaching and how much will be restored to the soil by the clover-roots, and how much of the fertility produced by feeding the bran and meal the trees will be able to readily secure, neither the theorist nor the practical man can tell. No charge should be made the sheep for the grass, as the work they will perform in transforming the poor apples and the worms into valuable fertilizers will be a fair equivalent for it.

Summing up the case, we have the orchard raised through skill and the unaided fertility of the soil. The draft made on the land by the production of apples and the necessary growth of wood, and the losses of fertility which may occur, are to be fully met by restoring to each acre yearly, through feeding animals upon it, some twenty-three pounds of nitrogen for the eight pounds removed by the apples, fourteen and a half pounds of potash for the thirteen removed, and nine pounds of phosphoric acid to replace the one carried off. It will be seen readily that if there is any deficiency it is likely to be in the potash, as scarcely more is returned to the soil than is removed by the fruit; so a dressing of potash is likely to not only improve the quality but the color and aroma of the fruit as well.

The hundred sheep would consume in five months at pasture 3,750 pounds of oil-meal, worth $28.00 per ton, and a like amount of bran at $17.00 a ton, and the two would cost together $82.50. The value of the plant-food left on the soil, computed at commercial prices, would be $43.07; but whether it is really worth that or not no one can tell. Can a hundred lean sheep, purchased in the spring, be made to gain $100.00 in value in five months of grazing and grain-feeding with a half a pound of meal per day per sheep, or with the feeding of three-fourths of a pound, if thought advisable? I cannot answer these questions accurately myself, and I leave them for your consideration. Yet I believe that the orchardist is growing too much wood, too many apple-seeds, too many apples, too poor apples, too many badly colored and badly flavored apples, and that this may be remedied by heading back the trees in lieu of thinning them, and by furnishing to the bearing orchard yearly a reasonable amount of available plant-food, largely through the aid of plants and animals. I am well aware that the methods here suggested will have to be varied to suit local conditions; still I claim that the principles involved are correct, and that if they are intelligently practiced in connection with the best-known methods of defending the fruit from its enemies, a great advance will be made.

In the Peach and Plum orchards the practices which I have suggested are not likely to be the best, as it will be found advisable, in most cases, to keep these constantly under cultivation. But here, as in the former case, fertility may be preserved by feeding animals during the winter, and by preserving and removing the manures produced to the orchards. I have the utmost faith that this method of getting plant-food, through plants and animals, will be found to be the most economical in most cases.

I contend (1), that the soil should be cultivated and plant-food set free to the utmost limit; (2), that leguminous and tap-rooted plants should be used as plant-food gatherers; (3), that animals should be kept as much for the value of the manure they produce, as for the profit realized from their other products; (4), that the least possible amount of stalk and vine and limb be grown consistent with economy and the health of the plant; and (5), after having practiced all the economy possible, if there is still a lack of fertility, in order to secure the highest quality of product and the greatest net income, that commercial fertilizers of a high grade should be applied with a liberal hand. If it is found at any time that commercial fertilizers give better net results than farm-manures, then there should be no hesitancy in changing from one to the other. I believe that farm-manures which have lain in the open yards or have been heated, and which have to be drawn long distances, are far more expensive than are high-grade fertilizers. Well-preserved manure is worth, on an average, scarcely more than $3.00 per ton, and our experiments prove that such manure, exposed in piles from April to October, often loses one-half of its value; therefore I am led to believe that many tons of manure which are transported from the city contain less than a dollar's worth of soluble plant-food. This manure may act beneficially as a mulch, but, so far as the plant-food it contains is concerned, it is too often an expensive way of preserving the fertility of the land.

Notes.

At the late meeting of the American Forestry Association the committee on Arbor Day reported that the day was now officially recognized and observed in thirty-seven states and territories.

We learn that by the fire which last week consumed the greenhouses of H. Meyers, of Passaic, New Jersey, more than 3,000 plants of Clematis paniculata were lost. This shows the growing popularity of this plant, which is of comparatively recent introduction. Fortunately, time enough still remains to get up a stock for the spring trade.

Messrs. Burpee & Co. publish a circular in which it is stated that the Bush Lima Beans which they distribute originated with Mr. Asher Palmer, of Chester County, Pennsylvania. The story goes that this particular plant, found in a field of ordinary Lima Beans, had been cut off about half an inch above the ground by a cut-worm, but that it had bent over and rerooted, and the result was the Bush Bean.

Professor L. R. Taft, horticulturist of the Michigan Agricultural College, publishes the following list of varieties of Beans

which have proved satisfactory at the experiment station there: Wax Beans—Cylinder Black Wax, Speckled Wax, Saddleback and Mammoth Wax; Green-podded varieties—Osborn Forcing, Dakota Soup, Hatt No. 3 and Shah; for field-culture—Burlingame, Snowflake and Hatt No. 2½.

According to Mr. Conder, who has written so much about the flowers of Japan, the Japanese cite 269 color varieties of the Chrysanthemum, of which 63 are yellow, 87 white, 32 purple, 30 red, 31 pale pink, 12 russet and 14 of mixed colors. A fancy prevails in the country that in this flower the same tint is never exactly reproduced, and that in this it resembles the endless variety of the human countenance.

In the recent report of the Superintendent of Public Instruction of the State of New York it is said that the interest in the planting of trees on Arbor Day and at other times has been greatly stimulated throughout the state during the past two years, by prizes offered for the best-kept district school-grounds by Mr. Wm. A. Wadsworth, of Geneseo. Last year the first prize of a hundred dollars was awarded to District School No. 6, of New Windsor, Orange County, and the second prize of fifty dollars to District School No. 1, of Manheim, Herkimer County.

Professor Bailey, of Brown University, writes in *The Brunonian* that the custom of planting class trees was begun there some thirty years ago, and that a great deal of eloquence and sentiment was expended over the young plants. Every tree is gone, however, the ground having been occupied for other purposes in most cases, although we infer that some of the trees perished from lack of care. He points the moral that if trees are to be planted in future they ought to be placed where there is a reasonable certainty of their remaining, and he might have well added they should never be planted unless they are planted well and there is a reasonable certainty that they will be well cared for afterward.

In a letter to the American Forestry Association, ex-Senator Edmunds writes: "The subject of forestry is of immense importance to the future welfare of all our countrymen, as well in Vermont as in the arid regions of our one country. I have seen in Europe much of the remediless evils of stripping the hills and mountain-sides of their forests great or small, and I have seen in our temperate and well-watered climate of Vermont how great has been the loss from reckless timber-cutting. The devastations of a dozen years can hardly be repaired in half a century, and so every energy of reason and persuasion ought to be brought to bear upon the public intelligence to avert the evils that so seriously threaten large parts of the republic from the destruction of the forests."

Professor Georgeson, of the Kansas Agricultural College, raised last year a crop of the Japanese Soy Bean (Glycine hispida), and offers to distribute them to such farmers of his state as are willing to try them. They are unknown, we believe, to the agriculture of this country, although sixty varieties of them, varying much in size, color, earliness, etc., are in use in Japan, and they have yielded in Kansas from twelve bushels to nineteen bushels an acre on low ground which was too wet for proper cultivation. Professor Georgeson thinks these beans, on account of their nutritious qualities, will prove valuable for farm crops and useful for stock feed, while, at the same time, they are excellent for table use. Professor Georgeson also offers for distribution two varieties of a small red bean which belongs to the species Phaseoles radiatus, also unknown in this country. They are more especially for table use, and are reputed to be the finest-flavored beans in existence.

A correspondent of *Meehan's Monthly*, in writing of Dentaria diphylla, in many places called Crinkle Root, on account of the peculiar shape of its roots, and Pepper Root in other places, on account of the pungent taste of its roots, states that the roots dried and pulverized have long been used as a condiment by the Canadian Indians just as it was used, according to Michaux, by the Indians of the Carolina mountains. To many persons these roots are quite palatable, and Mr. Meehan endorses the opinion of his correspondent that it is surprising that this root has never been introduced into vegetable-gardens. Many garden-plants, like the Radish, Turnip, Horse-radish, etc., belong to the same family, and, in their improved state, have become necessaries of life, and yet, when quite wild, they seemed no more promising as food-plants than the Crinkle Root. By judicious cultivation and selection it is probable that this root might be improved so as to be a valuable addition to our food-supplies.

A circular from the Horticultural Department of the Columbian Exposition states that a Rose-garden has been designed on the grounds to contain not less than 50,000 plants, besides special areas for other groups. As substantial premiums are to be offered for Roses in addition to the awards that are to be offered by the National Committee, Rose-growers are invited to prepare plants for this garden. Hardy Roses on their own roots must be in three and a half-inch or larger pots of the current year's growth, or they may be dormant plants one or two years old. Of course, Tea Roses, Noisettes and other tender kinds will require different treatment, and it is suggested that strong plants in five-inch pots be carried over in cold frames for planting early in the spring of 1893. It is also proposed to have large displays of herbaceous plants during their best season of flowering from the 1st of November, 1892, to the 1st of April, 1893, including Chrysanthemums, Cyclamens, winter-flowering Primroses, Cinerarias, Calceolarias, Amaryllis, Dutch bulbs and the like. Instructions have been sent to the various firms who propose to contribute flower-seeds, that plants are to be grown from them in the most approved manner without expense to the contributor, and it is expected that awards will be made for the plants produced in the order of their merit.

"The treasures of the common are endless," writes Mrs. Martin in her *Home Life on an Ostrich Farm*, of the neighborhood of Walmer, in Cape Colony, "and first and loveliest among them all is the little Wax-creeper (Microloma lineare), than which, tiny as it is, I do not think a more perfect flower can be imagined. It is as modest as a little Violet, and you have to seek it out in its hiding-places under the thick foliage of the bushes, round the stems of which it twines so tightly that it is a work of some time to disentangle it. You also get many scratches during the process, for it loves to choose as its protectors the most prickly plants; but when at last you hold the delicate wreath in your hands, and look into its minute beauties—the graceful curves of the slender stalk and tendrils, no two of which ever grow alike; the long narrow dark green leaves, and the clusters of brilliant carmine-tinted flowers, each like a tiny exquisitely shaped vase cut out in glistening wax—you are amply rewarded. It is, indeed, one of the masterpieces of nature. This little flower does not bear transplanting well. We often tried to domesticate it in our garden, but the plants invariably died. It was quite the rarest of all our flowers. We have never seen it anywhere but about Walmer, and there it grows only in small patches, five or six plants close together, and then perhaps no more of them to be seen during the whole of a long walk."

Catalogues Received.

The Anchor Post Company, 59 West Forty-second Street, New York; The Anchor Fence Post and Wire Fencing.—Albert Benz, Douglaston, N. Y.; German Fancy Pansies.—Joseph Breck & Sons, 51, 52 and 53 North Market Street, Boston, Mass.; Vegetable, Grass and Flower Seeds, Garden, Lawn and Greenhouse Implements.—William Bull, 536 King's Road, Chelsea, London, S. W., England; Flower and Vegetable Seeds, Bulbs.—Alfred Bridgeman, 37 East Nineteenth Street, New York; Flower and Vegetable Seeds, Bulbs, Small Fruits, Shrubs and Vines.—W. Atlee Burpee & Co., Philadelphia, Pa.; Burpee's Seed Annual of Novelties and Specialties for Farm and Garden.—E. R. Cochran & Co., Middletown, Del.; Wholesale Price-list of Peach-trees.—R. Douglas & Sons, Waukegan, Ill.; Wholesale Price-list of Hardy Ornamental Evergreens, Shade Trees, Forest-tree Seedlings, Tree Seeds.—J. Wilkinson Elliott, Pittsburgh, Pa.; Griffin's Tuberous Begonias.—H. G. Faust & Co., 64 and 66 North Front Street, Philadelphia, Pa.; Garden, Field and Flower Seeds.—P. H. Foster, Babylon, L. I., N. Y.; Wholesale Price-list of Trees, Shrubs and Vines.—John Gardiner & Co., 21 North Thirteenth Street, Philadelphia, Pa.; Flower and Vegetable Seeds, Mushrooms, Poultry.—William Baylor Hartland, 24 Patrick Street, Cork, Ireland; Flower and Vegetable Seeds.—George W. P. Jerrard, Caribou, Me.; Seed Potatoes, Vegetable Seeds.—W. W. Johnson, Snowflake, Antrim County, Mich.; Seedlings of Evergreen and Deciduous Trees, Shrubs, etc.—Harlan P. Kelsey, Linville, N. C.; Native Plants of the Southern Alleghany Mountains.—Wm. Henry Maule, 1711 Filbert Street, Philadelphia, Pa.; Seeds of Flowers and Vegetables, Vegetable and Ornamental Plants.—James Milne & Son, Scotch Grove, Jones County, Ia.; Hawkeye Grub and Stump Machine.—C. J. Pennock, Kennett Square, Chester County, Pa.; Trade Price-list of Carnations.—W. Piercy, 89 West Road, Forest Hill, London, S. E., England; Summer-flowering Chrysanthemums, also semi-early and late sorts.—Plant Seed Company, St. Louis, Mo.; Vegetable, Grass and Flower Seeds.—Price & Reed, Albany, N. Y.; Flower, Vegetable and Field Seeds.—T. H. Spaulding, Orange, N. J.; New Choice and Rare Chrysanthemums.—Stark Bros., Louisiana, Mo.; Fruit and Ornamental Trees.—Chas. Stevens, Napanee, Ontario; Wood Ashes.—James Vick's Sons, Rochester, N. Y.; Vick's Floral Guide.—James B. Wild & Bros., Satcoxie, Mo.; Fruit-trees.—Samuel Wilson, Mechanicsville, Bucks County, Pa.; Flower, Vegetable and Grass Seeds, Small Fruits and Fruit-trees.—I. C. Wood & Bro., Fishkill, Dutchess County, N. Y.; Flowering Plants, Shrubs, Vines and Trees.